

**Nebraska.**—Fort Niobrara, 23d, 24th, 25th; Fort Robinson, 8th, 9th, 10th, 12th; Genoa, 23d, 24th; Marquette, 23d; North Platte and Red Willow, 10th, 11th, 23d, 24th; Table Rock, 24th.

**Nevada.**—Carson City, 6th, 7th; Fort McDermitt, 2d, 3d, 6th, 24th, 25th, 27th, 28th.

**New Hampshire.**—Berlin Mills, Grafton, Gorham and Milan, 2d, 24th; Hanover and New Ipswich, 24th; Mount Washington, 2d, 3d, 24th, 29th, 30th, 31st.

**New York.**—Kiantone, 15th; Oswego, 31st.

**Pennsylvania.**—Chambersburg, 31st.

**Utah.**—Fort Thornburg, 16th, 27th, 28th; Salt Lake City, 27th, 28th.

**Vermont.**—Bellows Falls and Woodstock, 24th; Lunenburg, and Strafford, 2d, 24th.

**Washington Territory.**—Fort Spokane, 28th.

**Wisconsin.**—Lancaster, 13th, 25th; La Crosse, 13th, 21st; Madison, 13th; Ripon, 13th, 17th.

**Wyoming.**—Cheyenne, 8th, 10th, 11th, 12th, 22d, 23d, 27th, 30th.

#### MONTHLY SNOWFALLS.

[Expressed in inches.]

The following monthly snowfalls have been reported from the various states and territories during the month:

**California.**—Cisco, 15; Summit, 9.5; Emigrant Gap, 9.

**Colorado.**—Fort Collins, 7.5; Pikes Peak, 1.4.

**Dakota.**—Fort Buford, 10.7; Fort Hale, about 5.5; Fort Bennett, 2.

**Iowa.**—Humboldt, 2.

**Massachusetts.**—Rowe, about 3; Heath, 2.

**Michigan.**—Mackinaw City, .5.

**Minnesota.**—Duluth, about 3; Minneapolis, 2.5; Northfield, 2.

**Montana.**—Fort Maginnis, about 40; Fort Shaw, about 18.5; Fort Assiniboine, 4.7; Fort Ellis, about 4.5.

**Nebraska.**—North Platte, about 15.5; Genoa, 7; Marquette, 5; Stockham, 3.

**Nevada.**—Truckee, 15; Boca, 13.5; Otego, 4.5; Halleck, 3; Tecoma, 2; Winnemucca, 2; Carson City, 1.5; Toano, 1.5; Wells, 1.5; Battle mountain, 1.

**New Hampshire.**—Mount Washington, about 20; Berlin Mills, about 8; Grafton, 4.

**Utah.**—Ogden, 4; Blue Creek, 2.5; Corinne, 2; Nephi, 1.1; Promontory, 1.

**Vermont.**—Lunenburg, 7; Strafford, 4; Woodstock, 2.

**Wisconsin.**—Lancaster, 2.3; Ripon, 1.9.

**Wyoming.**—Fort Bridger, 8; Cheyenne, about 7.3.

On the summit of Mount Washington, New Hampshire, at the close of the month, there remained three inches of unmelted snow on the ground; at Fort Maginnis, Montana, three inches, and at Poplar river, Montana, half an inch.

Table of rainy and cloudy days, relative humidity, and dew-point for Oct., 1883.

Districts.	Rainy days.	Cloudy days.	Rel. humidity. %	Dew-point.
			Percentages.	
New England.....	From 10 to 18	From 3 to 11	From 69.8 to 79.1	From 36.1 to 45.7
Middle Atlantic states.....	" 12 " 20	" 7 " 16	" 65.1 " 81.7	" 38.5 " 55.3
South Atlantic states.....	" 6 " 15	" 6 " 16	" 71.8 " 89.1	" 53.9 " 64.9
Florida peninsula.....	" 10 " 16	" 2 " 10	" 80.5 " 81.9	" 58.8 " 72.7
East Gulf.....	" 5 " 11	" 4 " 9	" 68.0 " 75.4	" 58.5 " 64.2
West Gulf.....	" 10 " 18	" 2 " 12	" 74.7 " 82.0	" 55.9 " 69.1
Rio Grande valley.....	" 3 " 5	" 2 " 3	" 69.5 " 78.7	" 66.6 " 70.7
Ohio valley.....	" 13 " 15	" 12 " 17	" 70.5 " 75.9	" 44.5 " 50.4
Tennessee.....	" 13 " 21	" 11 " 16	" 80.5 " 82.3	" 56.3 " 58.4
Lower lakes.....	" 12 " 18	" 14 " 17	" 68.2 " 77.0	" 39.1 " 44.8
Upper lakes.....	" 14 " 19	" 9 " 18	" 70.2 " 76.7	" 33.3 " 42.3
Extreme northwest.....	" 10 " 16	" 14 " 17	" 78.7 " 83.2	" 31.9 " 33.7
Upper Mississippi valley.....	" 10 " 19	" 11 " 17	" 67.5 " 81.8	" 34.8 " 53.2
Missouri valley.....	" 12 " 18	" 9 " 14	" 69.2 " 77.0	" 32.1 " 43.7
Northern slope.....	" 6 " 18	" 6 " 11	" 57.9 " 78.3	" 23.4 " 36.4
Middle slope.....	" 6 " 13	" 5 " 8	" 56.4 " 74.2	" 29.3 " 45.6
Southern slope.....	" 5 " 14	" 5 " 13	" 56.9 " 79.1	" 44.0 " 58.2
Southern plateau.....	" 2 " 6	" 1 " 5	" 41.3 " 56.4	" 31.0 " 41.4
Northern plateau.....	" 12 " 18	" 7 " 13	" 65.7 " 77.5	" 34.8 " 37.2
North Pacific.....	" 15 " 21	" 11 " 17	" 78.6 " 86.9	" 43.1 " 47.1
Middle Pacific.....	" 6 " 9	" 2 " 3	" 60.9 " 80.6	" 42.3 " 50.4
South Pacific.....	" 2 " 7	" 0 " 4	" 49.1 " 70.4	" 44.7 " 51.4
Mt. Washington, N. H.....	Sixteen	Three	90.2	27.1
Pike's Peak, Col.....	Nine	One	83.1	12.2
Salt Lake City, Utah.....	Fourteen	Eleven	57.4	31.4

\* Relative humidity corrected for altitude.

#### SLEET.

Pike's Peak, Colorado, 3d.

Davenport, Iowa, 24th.

Humboldt, Iowa, 11th.

Allison, Kansas, 11th.

Leavenworth, Kansas, 24th.

Escanaba, Michigan, 5th, 13th.

Marquette, Michigan, 3d.

Fort Ellis, Montana, 7th.

Mount Washington, New Hampshire, 29th, 30th.

Fort Union, New Mexico, 28th.

Salt Lake City, Utah, 17th, 26th.

Cheyenne, Wyoming, 8th.

#### COTTON REGION REPORTS.

In the table below are shown the average rainfall and the means of the temperature extremes for October, 1883, in the cotton districts as determined from observations made at the stations shown on chart vi., issued with the REVIEW for April, 1882. For the purpose of comparison the averages for the corresponding month of 1882, with the changes are also given:

Meteorological Record of the Cotton Districts for the month of October, in 1882 and 1883.

Districts.	Average rainfall in inches.			Temperatures.						Extremes for Oct., 1883.	
	1882.	1883.	Departures.	Mean of the maxima.		Change.	Mean of the minima.		Change.	Max.	Min.
				1882.	1883.		1882.	1883.			
New Orleans.....	2.64	2.60	— 0.04	81.9	84.9	+ 3.0	62.0	65.9	+ 3.9	97	37
Savannah.....	4.95	0.44	— 4.51	80.0	83.6	+ 3.6	61.0	62.2	+ 1.2	97	41
Charleston.....	4.41	1.12	— 3.29	78.2	78.4	+ 0.2	55.3	55.8	+ 0.5	95	36
Atlanta.....	2.04	2.48	+ 0.44	76.2	76.1	— 0.1	55.1	56.9	+ 1.8	98	38
Wilmington.....	3.08	2.32	— 0.76	75.2	75.6	+ 0.4	53.5	55.2	+ 1.7	91	40
Memphis.....	2.02	4.22	+ 2.20	78.3	76.3	— 2.0	54.6	54.7	+ 0.1	94	32
Galveston.....	5.73	2.55	— 3.18	82.6	83.6	+ 1.0	60.4	63.4	+ 3.0	96	40
Vicksburg.....	4.21	5.16	+ 0.95	79.8	81.1	+ 1.3	56.6	61.5	+ 4.9	98	38
Montgomery.....	2.28	1.26	— 1.02	79.8	82.1	+ 2.3	58.0	58.5	+ 0.5	96	25
Augusta.....	2.64	1.56	— 1.08	77.5	78.6	+ 1.1	57.4	56.0	— 1.4	96	40
Little Rock.....	4.34	1.79	— 2.55	78.3	77.2	— 1.1	54.5	50.0	— 4.5	96	20
Mobile.....	2.34	2.37	+ 0.03	81.7	82.2	+ 0.5	58.3	59.8	+ 1.5	100	35

#### WINDS.

The most frequent directions of the wind during October, 1883, at the Signal Service stations, are shown on chart iii., by arrows flying with the wind. In the lake region, Ohio valley, and along the Atlantic coast the prevailing winds at most of the stations were from the northeast; in the upper Mississippi and Missouri valleys, they were mostly from the southeast; in the west Gulf states they were southerly; and in other districts they were variable.

#### HIGH WINDS.

On the summit of Mount Washington, New Hampshire, maximum velocities of fifty miles or more per hour occurred on the following dates: 3d, 4th, 5th, 10th to 14th, 15th, 18th, 19th, 20th, 29th, 30th, 31st. The highest velocities recorded were: 78, nw., 4th; 70, w., 14th; 80, sw., 29th; 94, w., 30th, maximum for the month.

On the summit of Pike's Peak, Colorado, maximum velocities of fifty miles or more per hour occurred on the 1st, 6th, 8th, 12th, 26th, and 30th. The highest velocity recorded was 72, w., on the 1st.

At Cape Mendocino, California, the highest velocities recorded were: 76, se., 23d; 82, se., 24th; 58, se., 26th.

Other stations reporting wind velocities of forty-five miles or more per hour are as follows:

Barneget City, New Jersey, 56, ne., 23d.

Block Island, Rhode Island, 55, ne., 24th; 48, ne., 21st.

Delaware Breakwater, Delaware, 53, ne., 23d.

Sandy Hook, New Jersey, 50, w., 30th.

Cheyenne, Wyoming, 48 nw., 29th.

Fort Benton, Montana, 48, sw., 29th.

Keokuk, Iowa, 48, s., 17th.

Nashville, Tennessee, 48, sw., 29th.

Fort Canby, Washington, 47, se., 25th.  
Cape May, New Jersey, 46, s., 29th.  
Kitty Hawk, North Carolina, 46, no., 15th.

## TOTAL MOVEMENTS OF THE AIR.

[In miles.]

In the following table are given the stations reporting the largest and smallest total movements of the air in each of the various districts:

Districts.	Stations reporting largest.	Miles.	Stations reporting smallest.	Miles.
New England.....	Block Island, R. I.....	11,854	New London, Conn.....	4,432
Middle Atlantic states.....	Del. Breakwater, Del.....	13,681	Lynchburg, Va.....	2,166
South Atlantic states.....	Kitty Hawk, N. C.....	13,630	Augusta, Ga.....	3,388
Florida peninsula.....	Key West.....	5,584	Sandford.....	5,030
East Gulf.....	Pensacola, Fla.....	5,830	Montgomery, Ala.....	3,939
West Gulf.....	Indianola, Tex.....	10,256	Fort Smith, Ark.....	3,799
Ohio valley.....	Louisville, Ky.....	6,073	Indianapolis, Ind.....	2,444
Tennessee.....	Nashville.....	4,751	Chattanooga.....	3,705
Lower lakes.....	Sandusky, Ohio.....	10,260	Cleveland, Ohio.....	6,072
Upper lakes.....	Milwaukee, Wis.....	9,542	Chicago, Ill.....	5,925
Extreme northwest.....	Moorhead, Minn.....	8,057	Saint Vincent, Minn.....	3,524
Upper Mississippi valley.....	Saint Louis, Mo.....	8,430	Dubuque, Ia.....	3,870
Missouri valley.....	Huron, Dak.....	6,953	Omaha, Neb.....	4,383
Northern slope.....	North Platte, Neb.....	7,462	Helena, Mont.....	3,348
Middle slope.....	Fort Elliott, Texas.....	8,684	Denver, Col.....	4,789
Southern slope.....	Fort Concho, Tex.....	6,572	Fort Davis, Tex.....	3,431
Southern plateau.....	Fort Grant, Ariz.....	4,047	El Paso, Tex.....	2,944
Northern plateau.....	Dayton, Wash.....	4,206	Leviston, Idaho.....	1,737
North Pacific.....	Fort Canby, Wash.....	7,303	Roseburg, Oreg.....	1,999
Middle Pacific.....	Cape Mendocino, Cal.....	14,597	Sacramento, Cal.....	3,988
South Pacific.....	San Diego, Cal.....	4,591	Yuma, Arizona.....	2,777

On the summits of Mount Washington, New Hampshire, and Pike's Peak, Colorado, the total movements of the air were 18,925 and 18,132 miles respectively.

## LOCAL STORMS.

Chattanooga, Tennessee.—The steamer "Anderson," on her way up the Tennessee river, was struck by a tornado from the southwest, at Guntersville, Alabama, at 1 p. m. of this date. Two of the crew were swept overboard by the waves, and the steamer and cargo were damaged to the extent of \$800.

Lead Hill, Boone county, Arkansas.—During the night of the 1-2d, a severe westerly storm passed along the line dividing Missouri and Arkansas. In Marion county, Arkansas, and in Taney county, Missouri, hundreds of trees and much fencing were blown down. The length of the storm's path was not ascertained, but its width varied from one-fourth to one-half mile. Heavy thunder and almost continuous lightning accompanied the storm. At this place only a few hailstones fell during the storm, but it is reported that large hail fell in other localities. The most violent part of the storm was about five minutes duration. From an examination of about two and one-half miles of the path of this storm no evidence of a whirling motion of the wind was observed as is commonly noticed in the paths of tornadoes. All the trees and limbs were blown in one direction, viz., toward the east.

Holton, Jackson county, Kansas.—The storm of the 1st was one of the most destructive that has visited this section for several years. A large number of buildings were unroofed and several were completely wrecked. The orchards and crops were badly damaged. At Soldier City, in this county, a school-house was blown from its foundation, one house was blown down, and several were unroofed. At Arrington, Atchison county, numerous buildings were damaged and several persons were injured. The depot at Larkin, Atchison county, was partially unroofed, and several other buildings were damaged.

Valley Falls, Jefferson county, Kansas.—A very severe storm visited this section during the afternoon of the 1st. The wind blew with great force and rain fell in torrents. A few buildings at this place were injured, the damage being comparatively small, but in the surrounding country the storm was much more destructive.

Salina, Saline county, Kansas.—A small tornado occurred at a point about fifteen miles south of this place on the 1st. A frame school-house was lifted from its foundation and carried a distance of several rods from where it formerly stood. The width of the tornado's path was about twenty feet and its duration was only a few minutes.

Leavenworth, Kansas.—The storm of the afternoon of the 1st was very severe in this vicinity. From 5.30 to 5.35 p. m. the wind blew at the rate of sixty miles per hour. About forty buildings in this city were more or less damaged and several persons were injured. The damage to property in this city and vicinity is estimated at \$15,000.

Fort Scott, Bourbon county.—A tornado passed in a north-easterly direction over Allen county, about forty miles west of this place at 6 p. m. of the 1st. About twenty buildings were injured along its course. At Fort Scott a violent storm prevailed at 8 p. m., during which some temporary buildings were slightly damaged.

Petersburg, Virginia.—A violent wind and rain storm occurred here on the afternoon of the 2d, blowing down fences and telegraph poles.

Bedford, Lawrence county, Indiana.—A very heavy wind and rain storm occurred in the southern part of this county on the morning of the 2d, which caused great damage to crops, fences and buildings.

Mr. H. Diaz Peña, international coöperating observer at Altata, Mexico, reports to this office as follows:

At 9 o'clock p. m., October 2d, a strong wind started up from the northeast, changing wildly to all points of the compass, increasing in strength at every moment, lasting till 5 o'clock a. m., of the 3d. It destroyed the whole town of Altata, leaving but four houses standing, and they, in a shattered condition. My anemometer and rain-gauge were carried away and smashed. In some places the sea washed as far as a mile beyond the high-water mark.

Arcadia, Trempealeau county, Wisconsin.—At about midnight of the 8-9th, a tornado passed over this vicinity in a direction from southwest to northeast. It was preceded by a deafening roar, and on its approach, the atmosphere assumed a peculiar reddish-green color, with a strong sulphuric odor. Barns and outbuildings were lifted from their foundations and torn to fragments. Broken boards, trees, bricks, etc., filled the air and were hurled with such force as to drive them through the sides of buildings. The large belfry of the graded school building was blown off, the spire being driven into the ground to a depth of several feet. The south end of the building was struck by lightning, and a large part of the brick wall was torn out.

Neillsville, Clark county, Wisconsin.—Considerable damage was done by the storm of the night of the 8-9th, in this city. Several dwellings and barns were blown down or unroofed and much fencing was destroyed.

Professor Edward S. Holden, of the Washburn observatory, University of Wisconsin, at Madison, reports that a violent thunder storm from the southwest occurred at that place at 6.30 p. m. on the 8th, and another at about 2.40 a. m. of the 9th. He also furnishes an interesting extract from the meteorological record of the observatory, showing the readings of the barometer, thermometer, and psychrometer, with the direction and velocity of the wind during the 8th and 9th. The record shows a maximum wind velocity of forty-eight miles per hour at 8.15 p. m. on the 8th. An observation at 8.15 a. m. of the 9th showed a minimum barometer reading of 28.733; temperature 67°; and wind velocity sixteen miles, from the south. Professor Holden states that the atmospheric conditions of the 8th were similar to those which preceded the storm of September 20th, and that the violent local storms which occurred in Wisconsin during the night of October 8-9th were anticipated by him.

Montgomery, Alabama, 16th.—A train on the Mobile & Montgomery railroad encountered a severe storm at about 4 a. m. of this date, when near Williams station. One of the cars was badly crushed by a falling tree and several passengers were injured.

Galveston, Texas.—Reports from Tyler, Smith county, state that during the night of the 18-19th, a train on the East Line & Red River railroad was struck by a tornado and blown from the track at a point a few miles east of Sulphur Springs, Hopkins county. The train was almost completely demolished and several passengers were seriously injured.

Natchitoches, Natchitoches parish, Louisiana.—A heavy rain storm occurred here on the morning of the 20th, deluging the streets with water.

Nashville, Tennessee.—A violent storm prevailed at this place during the evening of the 28th. Considerable damage was done to buildings throughout the city and many valuable shade trees were blown down.

Indianapolis, Indiana, 29th.—A violent storm occurred at Columbus, Bartholomew county, between 1 and 2 a. m., of this date, during which a number of buildings were unroofed.

Waterproof, Tensas parish, Louisiana.—A severe storm passed over the Tensas river at 3 a. m. of the 29th. The buildings on a number of plantations were blown down and several persons were injured.

Lexington, Kentucky.—A severe storm passed through Bourbon county at 2 a. m. the 29th, cutting a path through a dense forest for a distance of six miles. Fencing, barns and buildings were blown down. Three persons were buried beneath the ruins of one building, two of whom were killed. A second storm occurred at Paris, in this county, which unroofed a number of buildings and caused damage estimated at from \$25,000 to \$30,000. The roofs of three warehouses near the North Carolina freight depot were carried a distance of several hundred yards.

### NAVIGATION.

#### STAGE OF WATER IN RIVERS.

In the following table are shown the danger points at various river stations; the highest and lowest stages for October, 1883, with the dates of occurrence; and the monthly ranges. No high stages of water have occurred in any of the rivers. In the Ohio river and at stations on the Mississippi, south of Saint Louis, the highest water was recorded at the close of the month. The greatest range occurring during the month, eleven feet and eleven inches, was noted in the Ohio river at Cincinnati. In the upper Missouri and upper Mississippi rivers the monthly ranges have been less than twelve inches:

Heights of rivers above low-water mark, October, 1883.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>	<i>Ft. In.</i>		<i>Ft. In.</i>		<i>Ft. In.</i>	<i>Ft. In.</i>
Shreveport, Louisiana.....	29 9					
<i>Arkansas:</i>						
Little Rock, Arkansas.....	30 0	23	13 6	9 to 13	3 0	10 6
Fort Smith, Arkansas.....		20, 21	6 0	3, 4	3 0	3 0
<i>Missouri:</i>						
Yankton, Dakota.....	20 0	25 to 28, 30	1 2	10 to 17	0 10	0 4
Omaha, Nebraska.....	16 0	11	5 7	3, 4, 5	4 10	0 9
Leavenworth, Kansas.....	21 0	30	7 7	16	5 10	1 9
<i>Mississippi:</i>						
Saint Paul, Minnesota.....	14 6	22, 29, 30	2 6	4 to 7, 14, 21	1 10	0 8
La Crosse, Wisconsin.....	18 0	21	2 1	10	1 4	0 9
Dubuque, Iowa.....	21 10	2	4 10	12, 13, 14	3 10	1 0
Davenport, Iowa.....	15 0	3, 4, 20, 31	3 1	12, 16, 17	2 7	0 6
Keokuk, Iowa.....	14 6	6, 27, 28, 29	3 5	1	2 10	0 7
Saint Louis, Missouri.....	30 0	31	11 7	1	7 1	4 6
Cairo, Illinois.....	40 0	31	11 6	1	4 9	6 9
Memphis, Tennessee.....	34 0	31	7 0	1	2 3	4 9
Vicksburg, Mississippi.....	41 0	30, 31	11 7	5, 6	2 11	8 8
New Orleans, Louisiana†.....	—2 6	28	—12 2	8, 9, 10, 17	—13 8	1 6
<i>Ohio:</i>						
Pittsburg, Pennsylvania.....	20 0	31	10 1	19, 20, 21	0 9	9 4
Cincinnati, Ohio.....	50 0	31	17 6	27	5 7	11 11
Louisville, Kentucky.....	24 0	31	8 6	1	3 11	4 7
<i>Cumberland:</i>						
Nashville, Tennessee.....	42 0	30	9 3	1, 2, 3	0 10	8 5
<i>Tennessee:</i>						
Chattanooga, Tennessee.....	33 0	9	6 1	20 to 23	0 11	5 2
<i>Monongahela:</i>						
Pittsburg, Pennsylvania.....	29 0	31	10 1	19, 20, 21	0 9	9 4
<i>Savannah:</i>						
Augusta, Georgia.....		24	8 4	14 to 22, 24	4 2	4 2
<i>Willamette:</i>						
Portland, Oregon.....		1, 2	2 10	25	0 5	2 5
<i>Sacramento:</i>						
Red Bluff, California.....		27	1 10	8, 24	0 6	1 4
Sacramento, California.....		28	8 4	1	6 9	1 7
<i>Mobile:</i>						
Mobile, Alabama.....		2, 18	17 8	6	15 0	2 8
<i>Colorado:</i>						
Yuma, Arizona.....		30	15 4	13, 14, 15, 18	14 2	1 2

† Below high-water mark of 1874 and 1883.

### FLOODS.

Lead Hill, Boone county, Arkansas.—During the 8th and 9th more than five inches of rain fell at this place which caused the creeks in this vicinity to overflow. The farmers sustained heavy losses by having their fencing and unharvested crops swept away. On the morning of the 18th, Crooked creek, which flows through Boone and Marion counties, overflowed its banks, causing great damage to the crops on the adjacent farms. The streets in the town of Harrison, Boone county, were flooded and several houses were washed away. The water in Sugarloaf creek rose to a height seven feet higher than was ever before known. The crops on many farms on this creek were almost totally ruined, while the farms on the smaller streams suffered serious losses. More than four inches of rain fell at Lead Hill during the 18th and 19th.

Little Rock, Arkansas.—Reports from Bateville, Independence county, on the 21st, stated that at least 12,000 acres of corn and cotton lands in the White river valley in Independence county were inundated by the overflow, caused by the recent heavy rains. Very great damage was sustained by the small farms on White river and a large number of persons lost almost their entire possessions by the flood. This rise in the White river at this season of the year is unprecedented.

Key West, Florida, 21st.—Many houses in the eastern part of this city and all of the streets were flooded by the very heavy rain of this date. In some dwellings the water covered the floors to depths of from one to four feet and caused much damage. Numerous families were compelled to abandon their homes and to move their furniture, &c., in boats. The total rainfall for the 21st, was 9.23 inches, which is the heaviest precipitation ever known at this place.

Vincennes, Knox county, Indiana.—A heavy wind and rain storm passed over this vicinity during the afternoon and night of the 28th. The rain fell in torrents causing great damage on the farms in this section. Several cellars in this city were filled with water. The Wabash river rose rapidly at this place.

Terre Haute, Vigo county, Indiana, 29th.—The heavy rains of the past few days caused the Wabash river to rise seven feet on this date. The sudden rises in the smaller streams in this vicinity caused slight washouts on the Indianapolis, Saint Louis, and Vandalia railroads.

### HIGH TIDES.

New London, Connecticut, 2d.  
Savannah, Georgia, 18th.  
Cape Lookout, North Carolina, 10th, 11th, 16th to 20th, 24th, 25th.  
Fort Macon, North Carolina, 18th, 19th, 20th,  
New River Inlet, North Carolina, 28th, 29th.  
Portsmouth, North Carolina, 8th, 10th, 15th, 16th, 17th.  
Sloop Point, North Carolina, 6th.

### VERIFICATIONS.

#### INDICATIONS.

The detailed comparison of the tri-daily indications for October, 1883, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 90.14 per cent. The percentages for the four elements are: weather, 89.41; direction of the wind, 89.88; temperature, 91.34; barometer, 89.98 per cent. By geographical districts they are: For New England, 89.52; middle Atlantic states, 90.63; south Atlantic states, 89.77; eastern Gulf, 90.80; western Gulf, 90.23; lower lakes, 89.69; upper lakes, 91.67; Ohio valley and Tennessee, 89.62; upper Mississippi valley, 92.09; Missouri valley, 87.70; north Pacific, 75.00; middle Pacific, 93.00; south Pacific, 96.59.

There were forty-five omissions to predict out of 3,813, or 1.18 per cent. Of the 3,768 predictions that have been made, sixty-one, or 1.62 per cent., are considered to have entirely failed; fifty-six, or 1.49 per cent., were one-fourth verified; three hundred and sixteen, or 8.39 per cent. were one-half verified; four-